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ABSTRACT

SCORIT, a computer program which processes student responses to test items, is described and explained. The method of scoring responses according to an original test design and possible alternate test designs is detailed. The printing and punching of reports in a form suitable for correlational analysis are covered. A program description is furnished, along with data specifications. Card layout forms are appended. (SK)

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DATE: October 10, 1972

NO: TN 5-72-55

TITLE: SCORIT RESPONSE PROCESSING PROGRAM

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ABSTRACT

This document describes SCORIT, a computer program, which processes student responses to test items. Responses are scored according to an original test design and possible alternate test designs. Reports are printed and punched in a form suitable for correlational analyses.

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SCORIT RESPONSE PROCESSING PROGRAM

1.0 - PROGRAM IDENTIFICATION

SCORIT Response Processing Program

2.0 - OBJECTIVE

The purpose of SCORIT is to score student responses to test items. Processing is done by an original test design or by alternate test designs which are specified by the user. Response matrices are generated for correlational analyses.

3.0 - PROGRAM DESCRIPTION

3.1 - Program Narrative

This program accepts test response data and scores responses according to specified answer keys. The user provides the keys for scoring subtests and as many as nine alternate scoring keys. Alternate scoring keys are different keys that have alternate correct responses for specific items. Any number of tests may be processed in a single program run. Student responses are read, scored, and printed and punched in matrix form. Incorrect responses to individual items are coded as 0, correct responses a 1. Missing data are indicated by a code of 9, or 99 as in the case of subtest scores and alternate score totals. Reports are generated which include item response frequencies and histograms for subtest and alternate total scores. Scored response matrices are listed and punched for subsequent utilization.

3.2 - Variables - If a variable is subscripted, the numbers that are to be used as dimensions are indicated in parentheses. Other variables are not dimensioned. The type of the variables (integer or real) follows FORTRAN conventions.

IR (number of pupils or subjects, number of items)- student responses

IVAR (number of subjects) - general integer variable for scoring and accumulation

VAR (max[10, number of subtests]) - general real variable for accumulation

NSEQ (number of subjects) - subjects identification number

MIST (number of subtests max[number of responses per subtest]) - accumulate subtest frequencies and alternate key score frequencies

IWHICH (number of items) - indicates for each item, corresponding to column numbers, which subtest the item belongs.

IALT (number of alternate scoring keys, number of items, max number of alternate responses plus one) - alternate scoring keys.

NUM (number of alternate scoring keys, number of items) - number of alternate responses per item of alternate key

KAT (number of alternate scoring keys) - number of items per alternate key

LABEL (number of alternate scoring keys, 10) - a 40 column label for each alternate key

NPUPIL - number of subjects

NU - test number

NITEMS - number of items

NOUTCM - number of subtests, 0 if none

NSS - number of subjects for which data is reported

NPO - punch option
0, if no punch
1, if subtest scores and alternate score totals punched
2, if item scores, subtest scores, alternate key responses and alternate score totals punched

NRESP - maximum number of responses per item, e.g., if the test responses are 1, 2 or 3, and one allows for missing and multiple marks, NRESP = 5

NF - number of alternate scoring keys; 0, if none

NI - non-zero; if item scores are not to be done, only alternate keys

4.0 - SUBROUTINES AND FUNCTIONS

No subroutine or function is used.

5.0 - DATA SPECIFICATIONS

5.1 - Input Formats

Required and optional data card formats are described in Appendix A. An example of input cards for a test with a maximum of 20 pupils is illustrated in Figure 1. Test 10 has 20 items with five responses per item (missing marks, multiple marks and responses 1, 2 and 3), and four subtests. Punch option is 2, there is one alternate key and item scoring is to be done. Figure 2 confirms these specifications.

5.2 - Output Formats

Punched output card formats are described in Appendix B. Figures 3, 4, and 5 illustrate the item response frequency, subtest frequency, and alternate key score frequency reports, respectively, for the above example. Figures 6, 7, 8, and 9 illustrate item score, subtest score, alternate key responses by item, and alternate score totals, respectively, for the example. Figure 10 illustrates the punched card output for the example.

6.0 - PROGRAM CONSTRAINTS AND LIMITATIONS

6.1 - Program Language

FORTRAN IV

6.2 - Vendor

UCLA-CCN

6.3 - Storage Requirements
Program runs in 250 K word storage

6.4 - Hardware Configuration
IBM 360/91, punched card I/O

6.5 - Program Parameters
At present, for each test the following maximum values are placed on the input data:

1. number of pupils: 800
2. number of items per test: 40
3. number of responses per item: 10
4. number of subtests per test: 20
5. number of items per subtest: 40
6. number of alternate scoring keys per test: 9
7. number of items per alternate scoring key: 40
8. number of responses per item within alternate scoring key: 9

There is no limit to the number of tests processed in a program run.

6.6 - Error Messages
None

7.0 - OPERATING INSTRUCTIONS

The program is operated in batch mode.

Figure 1

Example: Input Cards

Figure 2

```
TEST NUMBER    10

NUMBER OF ITEMS    20
NUMBER OF SUBTESTS     4
NUMBER OF POSSIBLE RESPONSES     5
PUNCH CODE     2
NUMBER OF ALTERNATE SCORING KEYS     1


FORMAT FOR READING PUPIL RESPONSES

(7X,20I1,49X,I4)
```

Figure 3

TEST NUMBER 10

ITEM RESPONSE FREQUENCIES

ITEM NO.	MULTIPLE MARKS	MISSING MARKS	1	2	3
1	0 0.0	0 0.0	18 1.000	0 0.0	0 0.0
2	1 0.056	0 0.0	0 0.0	17 0.944	0 0.0
3	0 0.0	0 0.0	18 1.000	0 0.0	0 0.0
4	0 0.0	0 0.0	15 0.833	0 0.0	3 0.167
5	1 0.056	0 0.0	0 0.0	2 0.111	15 0.833
6	0 0.0	0 0.0	1 0.056	17 0.944	0 0.0
7	0 0.0	0 0.0	0 0.0	0 0.0	18 1.000
8	0 0.0	0 0.0	1 0.056	16 0.889	1 0.056
9	0 0.0	0 0.0	0 0.0	18 1.000	0 0.0
10	0 0.0	0 0.0	15 0.833	3 0.167	0 0.0

Figure 3 (cont.)

11	0 0.0	0 0.0	17 0.944	1 0.056	0 0.0
12	0 0.0	0 0.0	0 0.0	15 0.833	3 0.167
13	0 0.0	0 0.0	1 0.056	0 0.0	17 0.944
14	0 0.0	0 0.0	4 0.222	0 0.0	14 0.778
15	0 0.0	0 0.0	0 0.0	4 0.222	14 0.778
16	2 0.111	0 0.0	0 0.0	0 0.0	16 0.889
17	0 0.0	0 0.0	17 0.944	0 0.0	1 0.056
18	0 0.0	0 0.0	18 1.000	0 0.0	0 0.0
19	0 0.0	0 0.0	0 0.0	18 1.000	0 0.0
20	0 0.0	0 0.0	3 0.167	14 0.778	1 0.056

Figure 4

SUBTEST FREQUENCIES, TEST 10

SUBTEST	MEAN	0	1	2	3	4	5
1	4.61	0	0	0	1	5	12
2	4.67	0	0	0	1	4	13
3	4.26	0	0	1	2	6	9
4	4.61	0	0	0	0	7	11

Figure 5

ALTERNATE KEY SCORE FREQUENCIES, TEST 10

ALT.KEY	MEAN	0	1	2	3	4	5
1	4.94	0	0	0	0	1	17

Figure 6

ITEM SCORES - - BY ITEM

TEST	ITEM	SEC.NO.	SCORES
10	1	0	11911111111111111191
10	2	0	11911111111111111091
10	3	0	11911111111111111191
10	4	0	01911111110110111191
10	5	0	11911111011110110191
10	6	0	11911111011111111191
10	7	0	11911111111111111191
10	8	0	10911111111101111191
10	9	0	11911111111111111191
10	10	0	11911101011110111191

Figure 6 (cont.)

```
10    11     0     1191111111111111111191

10    12     0     0191111110111111111091

10    13     0     0191111111111111111191

10    14     0     0191101111111101111091

10    15     0     1190911101111011111191

10    16     0     1091111111111111111191

10    17     0     1191111011111111111191

10    18     0     1191111111111111111191

10    19     0     1191111111111111111191

10    20     0     0191911101111111111191
```

Figure 7

SUBTEST SCORES

TEST	SUBTST	SEQ.NO.	SCORES
10	1	0	4 599 5 5 5 5 5 4 5 4 5 5 3 5 5 4 499 5
10	2	0	5 499 5 5 5 4 5 5 5 5 5 4 4 5 5 5 599 5
10	3	0	2 599 4 4 4 5 4 4 5 5 5 3 4 5 5 5 399 5
10	4	0	4 499 4 4 5 4 4 4 5 5 5 5 5 5 5 5 599 5

Figure 8

ALTERNATE KEY RESPONSES BY ITEM

1. ALTERNATE KEY FOR: THIS IS AN EXAMPLE OF AN ALTERNATE KEY

TEST	ALT.KEY	ITEM	SEQ.NO.	SCORES
10	1	11	0	11911111111111111191
10	1	12	0	11911111111111111191
10	1	13	0	01911111111111111191
10	1	14	0	11911111111111111191
10	1	15	0	11911111111111111191

Figure 9

ALTERNATE SCORE TOTALS

1. TOTAL SCORES FOR ALT KEY: THIS IS AN EXAMPLE OF AN ALTERNATE KEY
   WITH 5 ITEMS.

TEST	ALT. KEY	SEQ. NO.	TOTALS
10	1	0	4 599 5 5 5 5 5 5 5 5 5 5 5 5 5 599 5

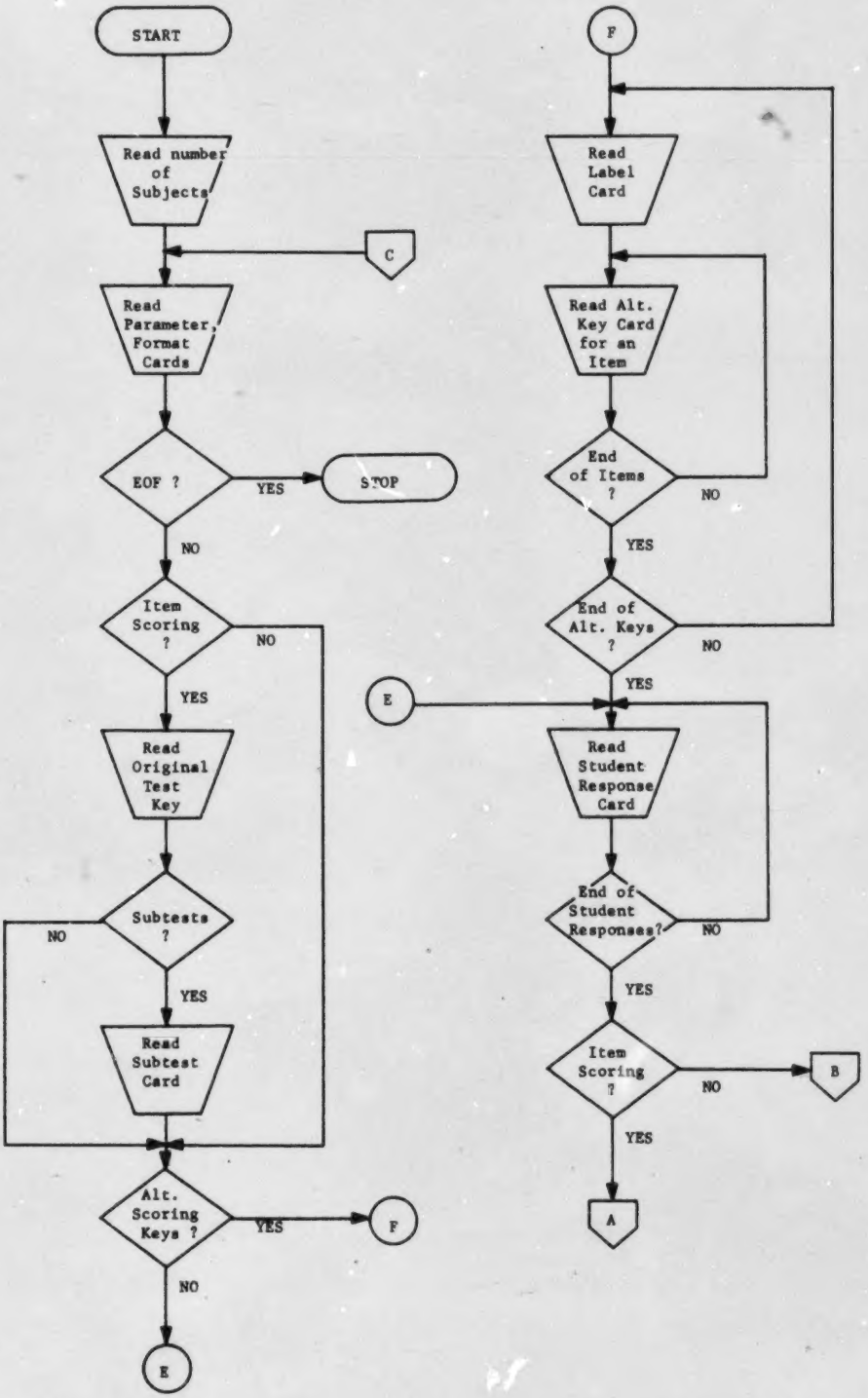
Figure 10

Example: Punched Output Cards

SWRL

Flowchart Layout Form

Programmer: MICHAEL J. BOHLEN
Date: 29 Sept 1972
Program ID: SCORIT
Page 1 of 3



FLOWCHART LAYOUT FORM

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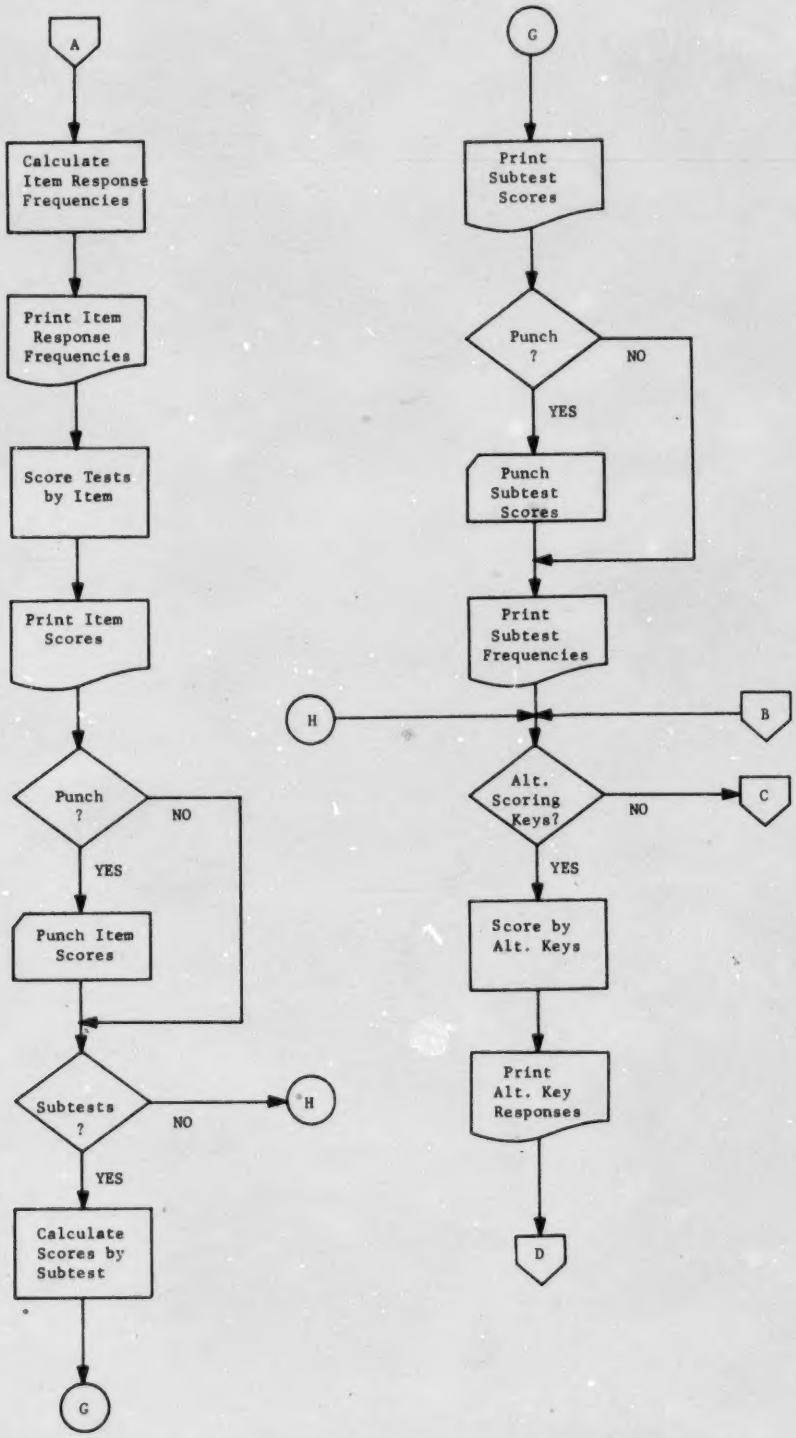

FLOWCHART LAYOUT FORM

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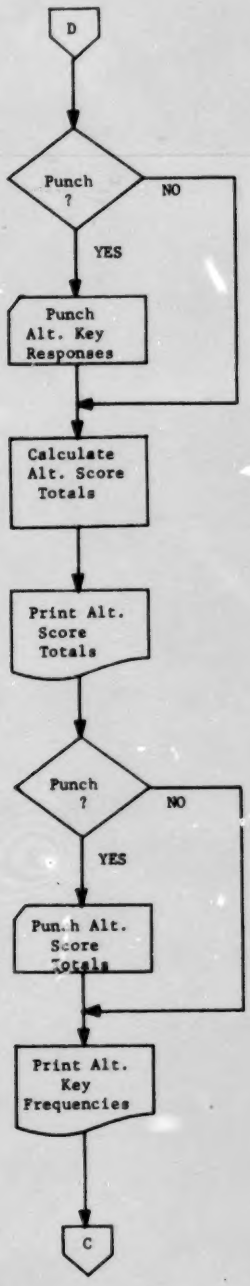


```
C     SCORIT
C
C     MIKE BOPLEN, SWRL, ROOM 274, EXT. 264
C
C     VARIABLES
C
C     IR( NUMBER OF SUBJECTS, NUMBER OF ITEMS) - STUDENT RESPONSES
C     IVAR( NUMBER OF SUBJECTS) - GENERAL INTEGER VARIABLE
C     VAR( MAX(10,NUMBER OF SUBTESTS))  - GENERAL REAL VARIABLE
C     NSEQ(NUMBER OF SUBJECTS) - THE SUBJECT'S IDENTIFICATION NUMBER
C     MIST( NUMBER OF SUBTESTS, NUMBER OF RESPONSES PER SUBTEST)
C     IWHICH( NUMBER OF ITEMS) - LIST OF WHICH SUBTESTS CORRESPOND TO
C                                THE RESPECTIVE KEYED ITEMS
C     IALT(# ALT SCORING KEYS, # ITEMS, # RESPONSES) - ALT SCORING KEYS
C     NUM( #ALT SCORING KEYS, # ITEMS) - NUMBER OF RESPONSES PER ITEM
C                                        OF ALT KEY
C     KAT(10) - NUMBER OF ITEMS PER ALT KEY
C     LABEL( # ALT SCORING KEYS, 10) - A 40 COLUMN LABEL FOR EACH
C                                      ALT SCORING KEY
C     IFMT(20) - FORMAT FOR READING STUDENT RESPONSES
C     NPUPIL - NUMBER OF SUBJECTS
C     NU - TEST NUMBER
C     NITEMS - NUMBER OF ITEMS
C     NOUTCM - NUMBER OF SUBTESTS
C     NPO - 0 IF NO PUNCH OUT
C           1 IF SUBTEST SCORES AND ALT SCORE TOTALS PUNCHED
C           2 IF ITEM SCORES, SUBTEST SCORES, ALT KEY RESPONSES AND
C             ALT SCORE TOTALS PUNCHED
C     NSS - THE NUMBER OF SUBJECTS FOR WHICH DATA IS REPORTED
C     NRESP - NUMBER OF RESPONSES PER ITEM
C     NF - NUMBER OF ALTERNATE SCORING KEYS, 0 IF NONE
C     NI - NON-ZERO IF ITEM SCORES ARE NOT TO BE DONE, ONLY ALT KEYS
C
      DIMENSION IR( 800,40),IVAR( 800),VAR(20),MIST(20,40),NSEQ( 800)
      DIMENSION IKEY(40),IWHICH(40),IFMT(20)
      DIMENSION LABEL(9,10),IALT(9,40,10),KAT(10),NUM(9,40)
C
C     READ NUMBER OF SUBJECTS
C
      READ(5,4000)NPUPIL
 4000 FORMAT(I4)
   30 READ(5,4001,END=3000)NU,NITEMS,NOUTCM,NRESP,NPO,NF,NI
 4001 FORMAT(4I2,I1,I2,I1)
C
C     READ FORMAT FOR READING STUDENT RESPONSES
C
      READ(5,1946)IFMT
 1946 FORMAT(20A4)
      WRITE(6,1939)NU,NITEMS,NOUTCM,NRESP,NPO,NF
 1939 FORMAT('1TEST NUMBER  ',I4//' NUMBER OF ITEMS  ',I4/
     1' NUMBER OF SUBTESTS  ',I4/' NUMBER OF POSSIBLE RESPONSES  ',I4/
     2' PUNCH CODE  ',I4/' NUMBER OF ALTERNATE SCORING KEYS  ',I4//)
      WRITE(6,1938)IFMT
 1938 FORMAT(' FORMAT FOR REALING PUPIL RESPONSES '//' ',20A4)
```

```
      IF(NI .GT. 0) GO TO 7700
C
C     READ KEY
C
      READ(5,50)(IKEY(I),I=1,NITEMS)
   50 FORMAT(80I1)
C
C     READ IWHICH
C
      IF(NOUTCM .EQ. 0) GO TO 718
      READ(5,50)(IWHICH(I),I=1,NITEMS)
  718 CONTINUE
 7700 IF(NF .EQ. 0) GO TO 1050
C
C     ALTERNATE SCORING KEYS
C
      DO 1060 I=1,NF
C
C     READ LABEL
C
      READ(5,1061)(LABEL(I,K),K=1,10)
 1061 FORMAT(10A4)
      DO 1063 J=1,50
      JJ=J
      READ(5,1066)(IALT(I,J,K),K=1,10)
 1066 FORMAT(40I2)
      IF(IALT(I,J,1) .EQ. 99) GO TO 1064
      DO 1065 LL=2,7
      LLL=LL
      IF(IALT(I,J,LL) .EQ. 0) GO TO 1068
 1065 CONTINUE
 1068 NUM(I,J)=LLL-1
 1063 CONTINUE
 1064 KAT(I)=JJ-1
 1060 CONTINUE
 1050 CONTINUE
C
C     READ STUDENT RESPONSES
C
      NSS=0
      J=1
   10 READ(5,IFMT,END=1000)(IR(J,I),I=1,NITEMS),NSEQ(J)
      IF(NSEQ(J) .EQ. 9999) GO TO 1000
      NSS=NSS+1
      J=J+1
      GO TO 10
C
C     CALCULATE ITEM RESPONSE FREQUENCIES
C
 1000 IF(NI .GT. 0) GO TO 7701
      K=NRESP-2
      WRITE(6,150)NU
  150 FORMAT('1TEST NUMBER ',I2//' ITEM RESPONSE FREQUENCIES'/)
      WRITE(6,1001)(I,I=1,K)
```

```
 1001 FORMAT(' ITEM NO.  MULTIPLE  MISSING', 10I6)
      WRITE(6,1002)
 1002 FORMAT(' ',12X,'MARKS    MARKS')
      K=K+1
      DO 2000 M=1,NITEMS
      DO 203 KK=1,10
  203 IVAR(KK)=0
      DO 201 L=1,NSS
      I=IR(L,M)+1
      IVAR(I)=IVAR(I)+1
  201 CONTINUE
      DO 202 J=1,K
      VAR(J)=IVAR(J)
      VAR(J)=VAR(J)/NSS
  202 CONTINUE
      VAR(10)=IVAR(10)
      VAR(10)=VAR(10)/NSS
      WRITE(6,170)M,IVAR(10),(IVAR(LL),LL=1,K)
  170 FORMAT('0',3X,I2,4X,I7,I9,3X,9I6)
      WRITE(6,177)VAR(10),(VAR(LL),LL=1,K)
  177 FORMAT(' ',13X,F5.3,4X,F5.3,3X,8F6.3)
 2000 CONTINUE
C
C     SCORE TESTS
C
      IF(NPO .LT. 2) GO TO 1813
      WRITE(7,1812)
 1812 FORMAT('-------------------------------------------------------
     1----------------------')
 1813 CONTINUE
      WRITE(6,8000)
 8000 FORMAT('1ITEM SCORES - - BY ITEM'/)
      WRITE(6,8001)
 8001 FORMAT(' TEST  ITEM  SEQ.NO.  SCORES'/)
      NOM=NPUPIL/75
      NAM=NPUPIL-NOM*75
      DO 300 I=1,NITEMS
      II=0
      DO 302 M=1,NPUPIL
  302 IVAR(M)=9
      DO 301 J=1,NSS
      IVAR(NSEQ(J))=1
      IF(IR(J,I) .NE. IKEY(I)) IVAR(NSEQ(J)) = 0
  301 CONTINUE
      IF(NOM .NE. 0) GO TO 3030
      L=0
      GO TO 3031
 3030 DO 303 K=1,NOM
      L=K*75
      LL=L-74
      WRITE(6,200)NU,I,II,(IVAR(LK),LK=LL,L)
  200 FORMAT(' ',I3,4X,I2,6X,I1,5X,75I1)
      IF(NPO .EQ. 2)WRITE(7,210)NU,I,II,(IVAR(LK),LK=LL,L)
      II=II+1
```

```
      IF(II .GE. 10) II=0
  303 CONTINUE
 3031 IF(NAM .EQ. 0) GO TO 300
      LL=L+1
      L=L+NAM
      WRITE(6,200)NU,I,II,(IVAR(LK),LK=LL,L)
      IF(NPO .EQ. 2)WRITE(7,210)NU,I,II,(IVAR(LK),LK=LL,L)
      WRITE(6,204)
  204 FORMAT('0')
  300 CONTINUE
  210 FORMAT(2I2,76I1)
C
C     PRINT SUBTEST SCORES
C
      IF(NOUTCM .EQ. 0) GO TO 719
      IF(NPO .LT. 1) GO TO 1814
      WRITE(7,1812)
 1814 CONTINUE
      WRITE(6,220)
  220 FORMAT('1SUBTEST SCORES'/)
      WRITE(6,223)
  223 FORMAT(' TEST SUBTST SEQ.NO.  SCORES'/)
      NOM=NPUPIL/37
      NAM=NPUPIL-NOM*37
      DO 402 I=1,NOUTCM
      DO 4077 MJB=1,40
 4077 MIST(I,MJB)=0
      KK=0
      VAR(I)=0.0
      DO 403 II=1,NPUPIL
  403 IVAR(II)=99
      DO 402 K=1,NSS
      M=0
      DO 401 J=1,NITEMS
      IF(IWHICH(J) .NE. I) GO TO 401
      IF(IR(K,J) .EQ. IKEY(J)) M=M+1
  401 CONTINUE
      IVAR(NSEC(K))=M
      VAR(I)=VAR(I)+M
      MM=M+1
      MIST(I,MM)=MIST(I,MM)+1
  402 CONTINUE
      IF(NOM .NE. 0) GO TO 4040
      L=0
      GO TO 4041
 4040 DO 404 JJ=1,NOM
      L=JJ*37
      LL=L-36
      WRITE(6,6200)NU,I,KK,(IVAR(LK),LK=LL,L)
 6200 FORMAT(' ',I3,4X,I2,5X,I2,5X,37I2)
      IF(NPO .GE. 1)WRITE(7,6210)NU,I,KK,(IVAR(LK),LK=LL,L)
 6210 FORMAT(40I2)
      KK=KK+1
      IF(KK .GE. 99) KK=0
```

```
  404 CONTINUE
 4041 IF(NAM .EQ. 0) GO TO 400
      LL=L+1
      L=L+NAM
      WRITE(6,6200)NU,I,KK,(IVAR(LK),LK=LL,L)
      IF(NPO .GE. 1)WRITE(7,6210)NU,I,KK,(IVAR(LK),LK=LL,L)
      WRITE(5,204)
  400 CONTINUE
C
C     WRITE SUBTEST FREQUENCIES
C
      WRITE(6,233)NU
  233 FORMAT('1SUBTEST FREQUENCIES, TEST ',I2/)
      K=0
C
C     COUNT NUMBER OF ITEMS PER SUBTEST
C
      DO 4010 I=1,NOUTCM
      IVAR(I)=0
      VAR(I)=VAR(I)/NSS
      DO 4020 J=1,NITEMS
      IF(IWHICH(J) .EQ. I) IVAR(I)=IVAR(I)+1
 4020 CONTINUE
      IF(IVAR(I) .GT. K) K=IVAR(I)
 4010 CONTINUE
      WRITE(6,4030)
 4030 FORMAT(' SUBTEST   MEAN        0')
      WRITE(6,7037)(I,I=1,K)
 7037 FORMAT('+',(22X,21I4))
C
C     PRINT
C
      DO 4045 I=1,NOUTCM
      L=IVAR(I)+1
      WRITE(6,235)I,VAR(I)
  235 FORMAT('0',2X,I2,4X,F8.2)
      WRITE(6,7038)(MIST(I,J),J=1,L)
 7038 FORMAT('+',(19X,21I4))
 4045 CONTINUE
  719 CONTINUE
 7701 IF(NF .EQ. 0) GO TO 30
C
C     SCORE BY ALTERNATE KEYS
C
      IF(NPO .LT. 2) GO TO 1815
      WRITE(7,1812)
 1815 CONTINUE
      WRITE(6,1071)
 1071 FORMAT('1ALTERNATE KEY RESPONSES BY ITEM'/)
      NOM=NPUPIL/74
      NAM=NPUPIL-NOM*74
      DO 1070 I=1,NF
      WRITE(6,1072) I,(LABEL(I,M),M=1,10)
 1072 FORMAT('0',I3,'. ALTERNATE KEY FOR:  ',10A4/)
```

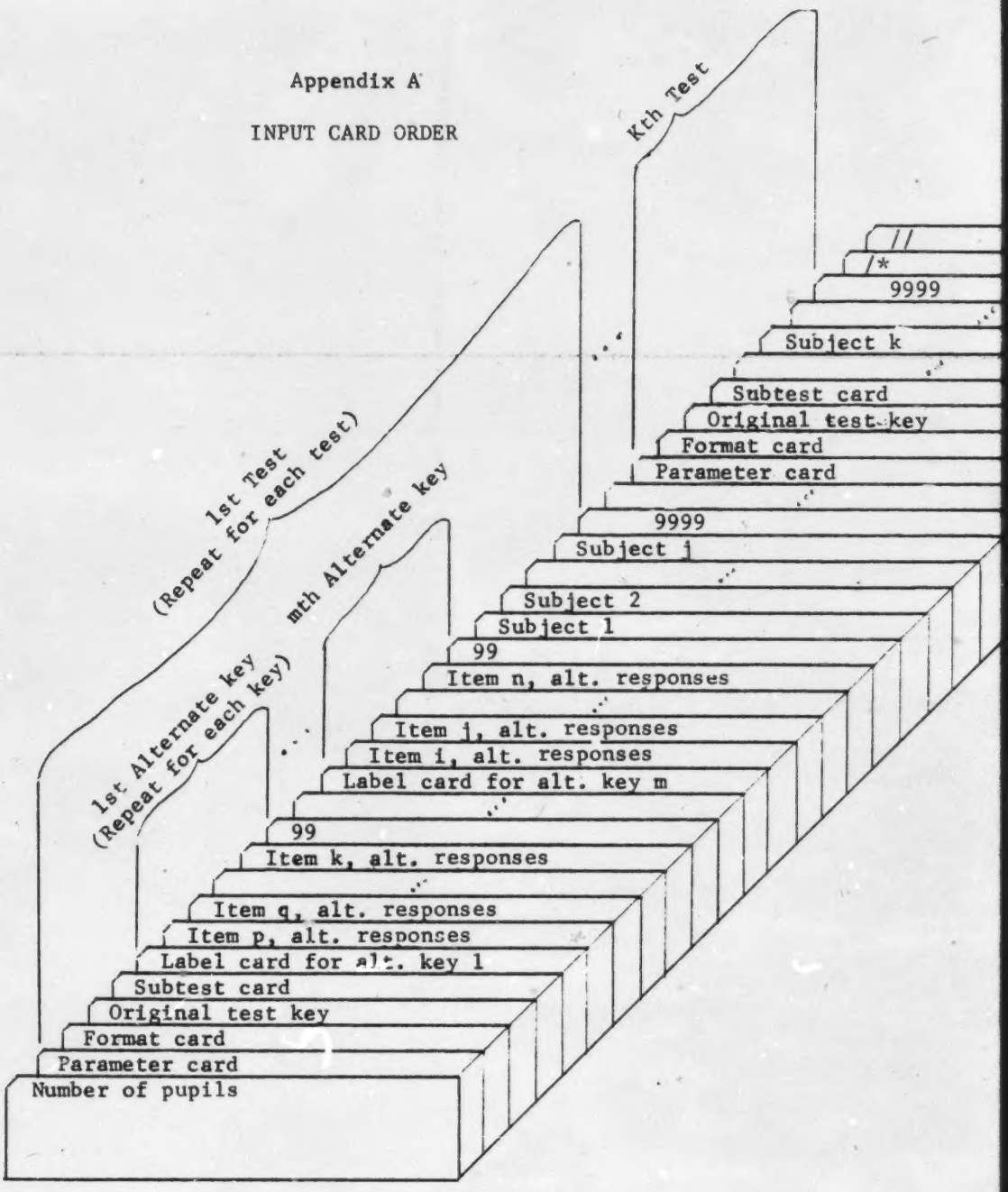
```
      WRITE(6,1069)
 1069 FORMAT('0TEST  ALT.KEY  ITEM  SEQ.NO.  SCORES'/)
      JJ=KAT(I)
      DO 1080 J=1,JJ
      II=0
      DO 1081 M=1,NPUPIL
 1081 IVAR(M)=9
      DO 1082 K=1,NSS
      IVAR(NSEQ(K))=1
      LL=NUM(I,J)
      DO 1083 L=2,LL
      IF(IR(K,IALT(I,J,1)) .EQ. IALT(I,J,L)) GO TO 1082
 1083 CONTINUE
      IVAR(NSEQ(K))=0
 1082 CONTINUE
      IF(NOM .NE. 0) GO TO 1090
      L=0
      GO TO 1091
 1090 DO 1092 N=1,NOM
      L=N*74
      LL=L-73
      WRITE(6,1093)NU,I,IALT(I,J,1),II,(IVAR(LK),LK=LL,L)
 1093 FORMAT(' ',I3,6X,I1,6X,I2,6X,I1,5X,74I1)
      IF(NPO .EQ. 2)WRITE(7,1094)NU,I,IALT(I,J,1),II,(IVAR(LK),LK=LL,L)
 1094 FORMAT(I2,I1,I2,I1,74I1)
      II=II+1
      IF(II .GE. 10) II=0
 1092 CONTINUE
 1091 IF(NAM .EQ. 0) GO TO 1080
      LL=L+1
      L=L+NAM
      WRITE(6,1093)NU,I,IALT(I,J,1),II,(IVAR(LK),LK=LL,L)
      IF(NPO .EQ. 2)WRITE(7,1094)NU,I,IALT(I,J,1),II,(IVAR(LK),LK=LL,L)
      WRITE(6,204)
 1080 CONTINUE
      WRITE(6,204)
 1070 CONTINUE
C
C     ALTERNATE SCORE TOTALS
C
      IF(NPO .LT. 1) GO TO 1816
      WRITE(7,1812)
 1816 CONTINUE
      NOM=NPUPIL/37
      NAM=NPUPIL-NOM*37
      WRITE(6,1200)
 1200 FORMAT('1ALTERNATE SCORE TOTALS'/)
      DO 1201 I=1,NF
      WRITE(6,1300)I,(LABEL(I,J),J=1,10),KAT(I)
 1300 FORMAT('0',I3,'. TOTAL SCORES FOR ALT KEY:  ',10A4/'      WITH',
     1I6,'  ITEMS.'/)
      WRITE(6,1301)
 1301 FORMAT('0TEST  ALT.KEY  SEQ.NO.  TOTALS'/)
      DO 1202 MJB=1,40
```

```
 1202 MIST(I,MJB)=0
      KK=0
      VAR(I)=0.0
      DO 1203 II=1,NPUPIL
 1203 IVAR(II)=99
      DO 1204 K=1,NSS
      M=0
      JJ=KAT(I)
      DO 1205 J=1,JJ
      LL=NUM(I,J)
      DO 1206 L=2,LL
      IF(IR(K,IALT(I,J,1)) .EQ. IALT(I,J,L)) GO TO 1207
 1206 CONTINUE
      GO TO 1205
 1207 M=M+1
 1205 CONTINUE
      IVAR(NSEQ(K))=M
      VAR(I)=VAR(I)+M
      MM=M+1
      MIST(I,MM)=MIST(I,MM)+1
 1204 CONTINUE
      IF(NOM .NE. 0) GO TO 1208
      L=0
      GO TO 1212
 1208 DO 1209 JJ=1,NOM
      L=JJ*37
      LL=L-36
      WRITE(6,1210)NU,I,KK,(IVAR(LK),LK=LL,L)
 1210 FORMAT(' ',I3,5X,I2,7X,I2,5X,37I2)
      IF(NPO .GE. 1)WRITE(7,6210)NU,I,KK,(IVAR(LK),LK=LL,L)
      KK=KK+1
      IF(KK .GE. 99)  KK= 0
 1209 CONTINUE
 1212 IF(NAM .EQ. 0) GO TO 1201
      LL=L+1
      L=L+NAM
      WRITE(6,1210)NU,I,KK,(IVAR(LK),LK=LL,L)
      IF(NPO .GE. 1)WRITE(7,6210)NU,I,KK,(IVAR(LK),LK=LL,L)
 1201 CONTINUE
C
C     WRITE ALTERNATE SCORE HISTOGRAM
C
C     FIND MAX ITEMS PER ALT KEY
C
      K=0
      DO 1400 I=1,NF
      VAR(I)=VAR(I)/NSS
      IF(KAT(I) .GT. K) K=KAT(I)
 1400 CONTINUE
      WRITE(6,1401)NU
 1401 FORMAT('1ALTERNATE KEY SCORE FREQUENCIES, TEST ',I3/)
      WRITE(6,1402)
 1402 FORMAT(' ALT,KEY  MEAN   0')
      WRITE(6,7039)(I,I=1,K)
```

```
 7039 FORMAT('+',(18X,21I4))
C
C     PRINT
C
      DO 1404 I=1,NF
      L=KAT(I)+1
      WRITE(6,1405)I,VAR(I)
 1405 FORMAT('0',I4,3X,F6.2)
      WRITE(6,7036)(MIST(I,J),J=1,L)
 7036 FORMAT('+',(14X,21I4))
 1404 CONTINUE
      GO TO 30
 3000 STOP
      END
```

Appendix A

INPUT CARD ORDER



DATE: _____

PROJECT: _____

CARD LAYOUT FORM

Type of Card 1. Number of subjects (input)

Field No.	Field Description	Columns From	Columns Thru	No. of Columns	Coding Instructions
1	Number of pupils	1	4	4	Integer value from 1 to 800 indicating the number of subjects, I4 format.

Comments:

Must be first card read, only one needed for a run of this program.

DATE: _____

PROJECT: _____

CARD LAYOUT FORM

Type of Card 2. Parameter Card (input)

Field No.	Field Description	Columns From	Columns Thru	No. of Columns	Coding Instructions
1	Test number	1	2	2	Integer value of test being scored, I2 Format.
2	No. of items	3	4	2	Integer value of number of items for the test I2 Format.
3	No. of subtests	5	6	2	Integer value of number of subtests for the test I2 Format.
4	No. of responses	7	8	2	Integer value of the number of responses for each test item, this number must include the number of responses per test item plus 2: for multiple and missing marks, I2 Format.
5	Punch options	9	9	1	Integer value: 0 - no punch out 1 - subtest scores and alt. score totals punched. 2 - item scores, subtest scores, alt. key responses and alt. score totals punched, I1 Forma
6	No. alt. scoring keys	10	11	2	Integer value for number of alternate scoring keys, 0 through 9, I2 Format.
7	Item scoring	12	12	1	Integer value: non-zero if item scoring not to be done, only alt. scores, I1 Format.

Comments:

Must be supplied for each test submitted.

DATE: _____

PROJECT: _____

CARD LAYOUT FORM

Type of Card 3. Format Card (input)

Field No.	Field Description	Columns From	Columns Thru	No. of Columns	Coding Instructions
1	Format	1	80	80	Format for reading subject response cards.

Comments:

This format card determines the format of the subject response card. Must be supplied for each test submitted and must include left and right parentheses.

DATE: _____

PROJECT: _____

CARD LAYOUT FORM

Type of Card 4. Original Test Key (input)

Field No.	Field Description	Columns From	Columns Thru	No. of Columns	Coding Instructions
1	Answer Key	1	40	40	Integer values for the correct responses, item numbers corresponding to column numbers, up to 40 items, I1 Format.

Comments:
Necessary if field number 7 of (2) parameter card is zero.

DATE: _____

PROJECT: _____

CARD LAYOUT FORM

Type of Card 5. Subtest Card (input)

Field No.	Field Description	Columns From	Columns Thru	No. of Columns	Coding Instructions
1	Subtest positions	1	40	40	Integer values indicating for the items, corresponding to column numbers, which subtest the item belongs, if an item does not belong to any subtest, code it 0, I1 Format.

Comments:

Necessary if field number 7 of (2) parameter card is zero, and number of subtests is non-zero. If number of subtests is zero, omit this card.

DATE: _____

PROJECT: _____

CARD LAYOUT FORM

Type of Card 6. Label Card (input)

Field No.	Field Description	Columns From	Columns Thru	No. of Columns	Coding Instructions
1	Label	1	40	40	Alphanumeric label that will be printed with the alternate scoring key, A Format.

Comments:

Necessary if field number 6 of (2) Parameter card is non-zero.

PROJECT:_____

CARD LAYOUT FORM

Type of Card 7. Alternate Key (input)

Field No.	Field Description	Columns From	Columns Thru	No. of Columns	Coding Instructions
1	Item number	1	2	2	Integer value of item number to be scored with alternate responses in the following columns, 99 (trailer card) to end items, I2 Format.
2	Alt. responses	3	20	18	Integer value: alternate responses for item in field 1. Up to nine alternate responses I2 Format.

Comments:

Necessary if field 6 of (2) Parameter card is non-zero. One card for each item within an alternate key.

PROJECT:_____

CARD LAYOUT FORM

Type of Card 8. Subject Response Card (input)

Field No.	Field Description	Columns From	Thru	No. of Columns	Coding Instructions
1	Item responses	X	Y	40	Integer values: 0 no response
					1-8 response chosen
					9 multiple response
2	ID number	W	Z	4	Integer value: 1-800 sequence
					number, 9999 (trailer card)
					to end test.

Comments:

Format of this card may vary. But its format must correspond to that of the Format Card. Item Responses: 1-40 items, must preceed ID number. Trailer number for ID to end test is 9999. One card for each subject participating in test.

PROJECT:_____

CARD LAYOUT FORM

Type of Card 8. Subject Response Card (input)

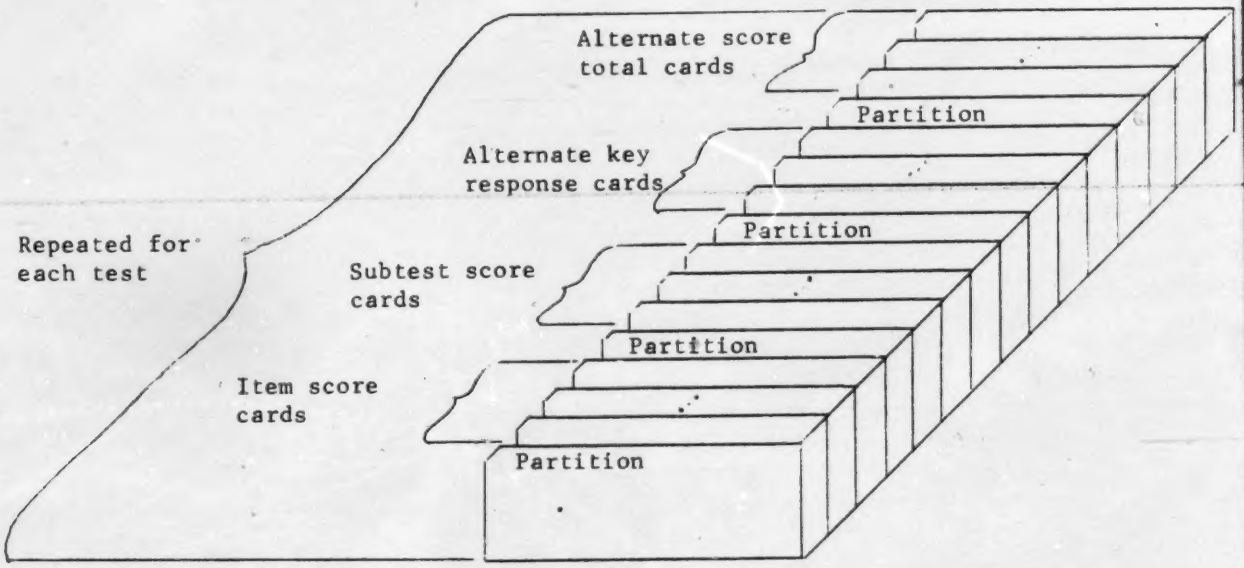
Field No.	Field Description	Columns From	Columns Thru	No. of Columns	Coding Instructions
1	Item responses	X	Y	40	Integer values: 0 no response 1-8 response chosen 9 multiple response
2	ID number	W	Z	4	Integer value: 1-800 sequence number, 9999 (trailer card) to end test.

Comments:

Format of this card may vary. But its format must correspond to that of the Format Card. Item Responses: 1-40 items, must preceed ID number. Trailer number for ID to end test is 9999. One card for each subject participating in test.

Appendix B

OUTPUT CARD ORDER



PROJECT:_____

CARD LAYOUT FORM

Type of Card 1. Item Scores (output)

Field No.	Field Description	Columns From	Columns Thru	No. of Columns	Coding Instructions
1	Test number	1	2	2	Integer value for test number, I2 Format.
2	Item number	3	4	2	Integer value for item number, I2 Format.
3	Card sequence number	5	5	1	Integer value indicating card sequence for item, 0 through 9, if more cards, numbers repeat, I1 Format.
4	Item scores	6	80	75	Integer: 0 incorrect 1 correct 9 missing data Each column is a data point, 75 per card, I1 format.

Card	Subject ID's
0	1-75
1	76-150
2	151-225
.	.
.	.
.	.

Comments:

These cards will be punched if field 5 of (2) Parameter card is 2 and item scoring is to be done (i.e., field 7 of (2) Parameter card is zero).

DATE: _____

PROJECT: _____

CARD LAYOUT FORM

Type of Card 2. Subtest Scores (output)

Field No.	Field Description	Columns From	Columns Thru	No. of Columns	Coding Instructions
1	Test number	1	2	2	Integer value for test number, I2 format.
2	Subtest number	3	4	2	Integer value for subtest number, I2 format.
3	Card sequence number	5	6	2	Integer value indicating card sequence for subtest, 0 through 99; if more cards, numbers repeat, I2 format.
4	Subtest scores	7	80	74	Integer: number of correct items in subtest, 99 if missing data. 37 per card. I2 format

Card number	Subject ID's
0	1-37
1	38-74
2	75-111
.	.
.	.
.	.

Comments:

These cards will be punched if field 5 of (2) Parameter card is one or two and subtest scoring is to be done. (i.e., field 7 of (2) Parameter card is zero) and field 3 of (2) Parameter card is non-zero.

DATE: _____

PROJECT: _____

CARD LAYOUT FORM

Type of Card 3. Alternate Key Responses (output)

Field No.	Field Description	Columns From	Columns Thru	No. of Columns	Coding Instructions
1	Test number	1	2	2	Integer value for test number, I2 format.
2	Alt. Key number	3	3	1	Integer value for alt. key number, I1 format.
3	Item number	4	5	2	Integer value for item number, I2 format.
4	Card sequence number	6	6	1	Integer value indicating card sequence for
					alt. key item, 0 through 9, if more cards,
					numbers repeat, I1 format.
5	Alt. Key scores	7	80	74	Integer: 0 - incorrect
					1 - correct
					9 - missing data
					74 per card, I1 format .
					Card number — Subjects ID's
					0 — 1-74
					1 — 75-148
					2 — 149-322
					3
					.
					.
					.

Comments:

These cards will be punched if field 5 of (2) Parameter card is 2 and alternate scoring keys are specified. (i.e., field 6 of (2) Parameter card is non-zero).

DATE: _____

PROJECT: _____

CARD LAYOUT FORM

Type of Card 4. Alternate Score Totals (output)

Field No.	Field Description	Columns From	Columns Thru	No. of Columns	Coding Instructions
1	Test number	1	2	2	Integer value for test number, I2 format.
2	Alt. Key number	3	4	2	Integer value for alt. key number, I2 format.
3	Card sequence number	5	6	2	Integer value indicating card sequence for
					alt. key, 0 through 99, if more cards, numbers
					repeat, I2 format.
4	Alt. Key totals	7	80	74	Integer: number of correct items in alt.
					Key, 99 if missing data, 37 per card, I2 Format.
					Card number — Subject ID's
					0 — 1-37
					1 — 38-74
					2 — 75-111
					.
					.
					.
					.

Comments:

These cards will be punched if field 5 of (2) Parameter card is 1 or 2 and alternate scoring keys are specified. (i.e., field 6 of (2) Parameter card is non-zero).

DATE: _____

PROJECT: _____

CARD LAYOUT FORM

Type of Card 5. Partition (output)

Field No.	Field Description	Columns From	Columns Thru	No. of Columns	Coding Instructions
1	Partition	1	80	80	Card of one "11" punch (minus sign) in all 80 columns to partition the sets of output cards for easier separation. I.E. one partition card will be punched as first card, then between item scores and subtest scores; subtest scores and alt. key responses; alt. key responses and alt. score totals, etc., if more than one test.

Comments: